

## **Project Specifications**

### **SECURITY GATE INSTALLATION**

**Redmond Airport Traffic Control Tower  
Redmond Regional Airport  
2522 SE Jesse Butler Circle #17  
Redmond, OR 97756 3499**

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Prepared by:

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### ATTACHMENT A – Additional Information

Section 02831 Chain Link Fence and Gates – Standard FAA Specification  
Technical Specifications for Pivot Gate Operator – Ideal Manufacturing  
Fence grounding information (excerpt section 3.7.11 from FAA Std 19e)

## **DIVISION 1 - GENERAL REQUIREMENTS**

### **1-1 Summary of Work**

**1-1.1** This project constructs an automatic vehicle pivot gate, camera, light and access controls.

Work includes pavement sawcutting; minor demolition; trenching and installing utilities and conduits; constructing short fence sections; installing pedestrian gate, installing vehicle gate with automatic gate operator; installing access pedestal with intercom and cipher lock; installing one camera, installing one area light and 10' pole; and landscape repair; installing gate release button and connecting intercom to phone in tower cab.

**1-1.2** **Applicable Documents** - Codes and standards on the drawings and in other specification sections.

**1-1.2.1** Referenced codes and standards establish qualities and types of workmanship and materials and establish methods for testing and reporting.

**1-1.2.2** Where these Contract Documents require materials and workmanship that exceed the referenced code or standard, the Contractor shall provide materials and workmanship that meet or exceed the requirements of these Contract Documents and the referenced code or standard.

### **1-2 Order of Precedence**

In case of any differences between the following, the following order of precedence shall govern:

- a. The Schedule
- b. Contract Clauses
- b. FAA Standard Specifications
- c. Project Specifications DIVISION 1 – 16
- d. Project Drawings
- e. Other documents and attachments

### **1-3 Government Furnished Material**

Fourteen each fence "No Trespassing" metal shield signs.

#### **1-4 Progress Chart**

The contractor will submit a proposed progress chart within 5 calendar days after the award of contract. The progress chart shall identify start date, completion date and major phases of work.

#### **1-5 Work Schedule**

The work will be performed as necessary to complete all construction within sixty (60) calendar days from and including the Notice-To-Proceed (NTP).

Any work on weekends will be coordinated with the Resident Engineer. Work on holidays is not allowed unless approved by the Resident Engineer in advance.

#### **1-6 Submittals**

Three copies of marked up catalog cuts and/or drawings will be provided for approval five calendar days prior to ordering materials or beginning fabrication. One copy will be returned after review by the Contracting Officer or his designate representative. At Contractor option, emailing one copy of PDF submittals is permitted in lieu of multiple paper copies. If submittals show deviations from the contract requirements, such deviations shall be noted.

The contractor will provide submittals for:

1. Vehicle pivot gate
2. Gate entrapment protection photocells
3. Preformed vehicle loops
4. Pedestrian gate with lockset and detail
5. 10' light pole
6. LED lifght fixture
7. Camera
8. Camera enclosure.
9. Access control keypad
10. Access control intercom
11. Intercom telephone call button and CAB gate release button
12. Splice hand holes
13. Shop drawing - pedestrian gate, lockset, and tamper-resistant plate.

#### **1-7 Use of Site Utilities During Construction**

Contractor will provide on site portable sanitary facilities for duration of project.

Electrical power and water are available at the project site. These utilities may be used by the Contractor without additional charge during the contract.

## **1-8 Protection of Existing Utilities and Cables**

Contractor will protect existing buried utilities or cables from damage.

Contractor will retain a qualified locate service such as Oregon Utility Notification Center 800 332 2344 and have locates performed prior to commencing any excavation.

The Contractor will paint utility or cable crossings. Contractor will hand excavate trenches to locate existing buried utilities before proceeding with machine excavation.

Existing buried utility lines, utility structures and underground cables shown on the drawings are approximate. The Contractor will immediately repair damage to utilities or cables caused by Contractor, subcontractor or suppliers on site, whether or not such utilities are shown on the drawings. The Contractor will immediately report any damage to existing utility lines to the Resident Engineer.

If Contractor encounters buried utility lines within the area of operations not shown on the plan, the Contractor will notify the Resident Engineer so necessary measures may be taken to determine status of the lines and prevent damage or interruption of the service.

## **1-9 Coordination**

### **1-9.1 Preconstruction Conference:**

The Contractor will attend a preconstruction conference with the Contracting Officer or designated representative, the Resident Engineer, a local representative of the facility, and a representative of the Redmond Municipal Airport to determine the operating procedures that the Contractor will comply with to meet FAA and Airport requirements.

The FAA will discuss Safety and Health checklist (Form N 3900-8) at the meeting. The checklist will include review of Occupational Safety, Health, and Environmental impacts including Critical Power Systems, potentially hazardous materials, and other applicable items.

### **1-9.2 Site Representative**

The Contractor will designate an on-site representative to act for the Contractor. The Contractor will coordinate construction with the Resident Engineer.

## **1-10 Layout**

The Contractor will verify established control points required for construction layout. Water based marking paint is permitted to mark construction layout. This includes pavement sawcuts for induction loops, cable pull box locations, light foundation and gate operator foundation locations. The Contractor will maintain the specified layouts to assure proper alignment of constructed features.

## **1-11 Special Requirements**

### **1-11.1 Parking Lot Operation and Restrictions**

With the exception of the shutdown permitted below, Contractor will maintain vehicle access to the FAA parking lot.

When installing gate panel, making pavement cuts for induction loops and trenching for photo electric eyes and patching pavement; Contractor may block vehicle access to FAA parking lot for up to 24 consecutive hours. Pedestrian access must be permitted during this road closure.

For coordination purposes, Contractor will notify the RE 24 hours advance of closing the tower parking lot.

**1-11.2 Liability Insurance** - The Contractor will obtain and maintain comprehensive general liability insurance against any and all claims for damages to person or property which may arise from his/her operations. Coverage will include Contractor, subcontractors and anyone directly or indirectly employed by them. The comprehensive general liability insurance will be combined single limit for broad form property damage and bodily injury.

**1-11.3 Permits and Licenses** - The Contractor is responsible for obtaining any permits and licenses required for the work in this contract.

## **1-12 Safety and Operating Regulations**

**1-12.1 Safety Regulations** – The contractor will ensure that all employees and subcontractors comply with CFR 29 part 1910, CFR 29 part 1926 and FAA Order 3900.19B.

The contractor will ensure that all employees use proper PPE (personal protective equipment) at all times.

The contractor will not allow the operation of equipment and tools by employees not trained to do so.

Contractor will place appropriate barricades or lath stakes around perimeters of active work areas. For barricades in place during hours of darkness, Contractor will mount flashers on barricades. Flashers will conform to Type A omni-directional barricade warning lights.

For trenches left open overnight or a weekend, Contractor will stake and flag work area limits with 3-foot tall stakes at 25-foot intervals in areas of dirt or grass. Contractor will delineate work area limits on hard surfaces with barricades or cones spaced a maximum of 25 feet apart. Contractor will firmly anchor or weight barricades as required.

**1-12.2 Submittals**-The contractor will provide the following submittals.

- A. Contractor safety plan
- B. Lockout/Tagout Plan
- C. Emergency Plan
- D. Material Safety Data Sheets.

**1-12.3 Personnel Security Information**

Contractor will submit the following information to the RE of personnel who will work inside the ATCT:

Full Name  
Employer  
Social Security Number  
Address  
Date of Birth

Contractor personnel working on site will NOT be required to obtain temporary FAA ID badges. Contract personnel will be located in vicinity of RE and monitored by the RE.

If a criminal check of a contract worker shows conviction of a disqualifying crime, such personnel may not be permitted on the job site. Information disqualifying a worker is considered confidential, but will be provided to the worker if they request such in writing.

**1-13 Definitions**

Airfield environment - areas restricted to public access on the airfield or in the buildings.

Airport Operations Area (AOA) - That portion of the airport designed and used for landing, taking off, servicing, and surface maneuvering of aircraft.

NIC – not in contract. Work so labeled on the drawings is not included in this contract and will be performed by others.

Work area – Work area is considered 10' on either side of proposed fence lines and utility trenches. If needed to define and protect work areas, Contractor may delineate work areas using 3-foot stakes at 25-foot intervals on dirt or grass or with traffic cones on paved surfaces. Resident Engineer may extend limits upon request and FAA approval. In addition to these work limits, Contractor outside storage area and vehicle/equipment parking areas will be defined at the prework meeting on site.

END OF SECTION

## **DIVISION 2 SITEWORK**

### **02055 - Site Demolition**

Remove "No Parking" sign, cut and remove concrete curb segment, saw cut asphalt pavement as shown on the site plan. Dispose off site.

**1.1** - Where trenches are located on lawn, cut sod and save for reuse or provide new sod. Stack sod pieces in protected area on site. Keep sod damp to maintain viability until reused. Replant sod within 7 calendar days. Do not replant damaged sod. Provide new sod as necessary to fill trench completely.

**1.2** - Saw cut and remove asphalt and subgrade for pivot gate concrete foundation.

**1.3** - Saw cut asphalt pavement for trench across gate opening, trench to pedestal, induction loops, grounding conductors, conduit for power and controls conduits to the automatic gate operator, video camera and light pole.

### **02315 - Trench Excavation and Backfill**

**1. General** - The Contractor will excavate trenches where shown on drawings. Install fibercrete handholes where shown.

**2. Protect Existing Utilities** - Perform trenching to prevent damage to existing underground utilities shown on the site plan or marked on the ground. Hand trench around known utilities to avoid damaging. Contractor will show existing utilities encountered on the red line drawings and mark such utility locations on the ground with marking paint.

**3. Trench Locations** - Locate trenches as shown on the drawings. Minor deviation in trench routing will be permitted to avoid existing buried lines or utilities. Coordinate any route changes with Resident Engineer.

**4. Trenches** - Trenches will be 27" deep. Trenches will be minimum 6" wide for a single conduit and minimum 12" wide for two conduits (to separate power from communications conduits) or as shown on the drawings. Any overexcavation will be filled material excavated from the trench. The fill material will be placed at optimal moisture condition to assure good compaction. Excessive moisture will not be permitted in backfill.

**5. Excavated Material** - Material excavated is unclassified. Perform excavation so that all paved areas are continually and effectively drained. Water will not be permitted to accumulate in open trenches. Backfill operations will be delayed if Resident Engineer determines backfill material is too wet to obtain proper compaction.

**6. Utilization of Excavated Materials** - Contractor will remove any excess excavated material from the vicinity and dispose at the Contractor's expense. Satisfactory excavated material will be used in the work. Excavated material will be stored and disposed such that it does not obstruct flow to any drainage inlet.



Excavated materials stored on site for more than 24 hours will be covered with impervious sheeting to prevent runoff siltation. Hay bale silt barriers will be required when siltation of excavated material stored on site is possible.

**7. Suitable Backfill Material** - Material suitable for backfill will be free of shale, sod, clods and stones larger than 2 inch largest dimension.

**8. Preparation of Surface for Fill and Embankment** - Trenches designated to receive fill and will be inspected by RE before placing material. The finished surface will be smooth, compacted and free from irregular surface changes. If necessary, final finish shall be obtained by hand raking.

**9. Source of Fill Material** - Fill material will be selected for the particular fill area for which it is to be used. Fill material will not be confused with surfacing aggregate. Necessary disposal of debris will be considered incidental to excavation and shall be performed by the Contractor.

Contractor will either use stockpiled excavated material for backfill or dispose of same.

At their option and expense, FAA or Redmond Airport may test imported materials for contaminants. If contaminants are present, imported material will be rejected for use.

**10. Trench Backfill** - Backfill trenches only after conduit installation inspection by the Resident Engineer. The first layer of backfill will be 6" deep, loose measurement. Material will be select excavated material with no aggregate more than 1" largest dimension. Fill material in this layer will not be compacted.

The second layer of trench backfill will be 6" deep loose measurement, and will contain no particles that would be retained on a 1-inch sieve.

All subsequent layers will be 6" deep, loose measurement and will consist of excavated material. Each layer will be compacted by a minimum of one pass of a mechanical tamper.

Backfill trenches completely and tamp level. Leave sufficient space in backfilled trench to plant sod or lay asphalt pavement as appropriate. Trenches will be left clean and neat after backfill.

**11. Compaction Methods** - Compaction will be performed using the method and equipment suitable for the area as specified. Mechanical hand tampers will be used in footings, slabs and trenches where roller use is not practical. Areas requiring compaction shall be compacted to 95% maximum density per ASTM D 1557 unless otherwise noted.

**12. Determination of Density** - The government may require compaction testing at anytime as deemed necessary to assure compliance to the plans and specifications. The contractor, with approval from the Resident Engineer, will arrange for maximum density and field density tests to be performed by a certified testing laboratory. Maximum density tests will be performed in accordance with ASTM D 1556, D 2167, D 2937, or D 2922. The test results will be expressed as a percent compaction which is defined as the density of the compacted layer expressed as a percentage of the maximum density of the material. If the tests show compaction less than specified, the Contractor

will correct the situation and be responsible for all costs of testing. Otherwise, the tests will be at Government expense.

**13. Exterior Conduit and Buried Conduit** - Provide schedule 40 PVC conduit for communications conduit as noted on the drawings. Use rigid galvanized steel conduit in exterior exposed power conduit locations as shown on the drawings. Affix conduit securely to exterior surfaces with unistrut or other approved fastener system. Wrap RGS conduit stubs with 10 mil 3M insulating tape wrap in buried locations.

**14. Splice Hand Holes** - Provide 2 composite fibercrete handholes 12 x 18 x 18 deep with secure bolt down on one corner lid. Provide one lid marked COMM. Provide one lid marked ELECTRIC. ConCast Inc model FH-12-18-18-E. Concast Inc model FH-12-18-18-C. Or approved equal. Splicing not permitted in hand holes.

### **02510 - Access Road Pavement Repair**

**1. General** - The Contractor will provide the necessary materials, labor and equipment to prepare subgrade and place new asphalt concrete over trench in paved road. Provide 6" depth of compacted base course. Apply soil sterilant to base course. Provide total asphalt thickness of 3" in two 1-1/2" lifts. Compact lifts with mechanical tamper or roller. Asphalt patch will be level with adjacent road grade. Seal pavement seams with emulsified asphalt.

**2. Materials** - The Contractor will furnish free-draining base course and hot mix asphalt in accordance with Oregon State standards or specifications.

**3. Aggregate Base Material** - The aggregate base course will be in 3/4" minus crushed aggregate as shown below. Base will consist of both fine and coarse crushed stone or crushed gravel blended, or if required, with sand, finely crushed stone, crusher screenings or other similar approved materials. The mixture of aggregates will be capable of being compacted into a dense and well bonded base. Crushed stone will consist of hard, durable stone particles or fragments, free from excess of flat, elongated, soft or disintegrated pieces, dirt.

Base will have a percent of wear not more than 35, at 500 revolutions, as determined by ASTM C 136. The material gradation shall be as determined by ASTM C 117 and ASTM C 136, and meet the following gradation requirements:

**CRUSHED AGGREGATE GRADATIONS**  
**PERCENTAGES BY WEIGHT PASSING SQUARE MESH SIEVES**

| <u>Sieve Size</u> | <u>2" Minus</u> | <u>3/4"</u> |
|-------------------|-----------------|-------------|
| 2- inch           | 90-100%         |             |
| 1-inch            | 55-83%          |             |
| 3/4"-inch         |                 | 90-100%     |
| 3/8-inch          |                 |             |
| No. 4 Sieve       | 30-60%          | 40-65%      |
| No. 8 Sieve       |                 | 30-50%      |
| No. 30 Sieve      | 10-25%          |             |
| No. 200 Sieve     | 0-8%            | 3-9%        |

**4. Preparation of Ground Surface** - Areas designated for asphalt pavement will be compacted to 95 percent of maximum dry density per ASTM D 1557.

**5. Surfacing** - Surfacing will be done when the ground is dry and unfrozen. Placement will be made to match adjacent grade.

**6. Compaction of Aggregate** - Immediately upon completion of the spreading operations, aggregate will be compacted. The number, type and weight of rollers will be sufficient to compact the material to the required density. The in-place field density will be determined in accordance with ASTM D 1556 or D 2167. If the specified density is not attained, the backfilled trench will be reworked and recompact until the specified density is reached.

**7. Access Road Surfacing** - Compact to 95% of maximum density in accordance with ASTM D 1557.

**8. Quality Assurance** - The Contractor will provide a sieve analysis showing base course aggregate meets gradation requirements. The Contractor will provide to the Resident Engineer, at the time of material delivery, one copy of the aggregate or asphalt concrete delivery tickets. Tickets will include the delivery date, time dispatched, name and location of the project, name of Contractor, name of supplier, truck number, quantity and composition of job mix formula.

**02821 - Fence Segments**

**1. General Requirements**

**1.1** - Construct new fence segments as shown on the drawings. Fabric height of new fence sections will match existing fence fabric height. Install 12" high angled top arms on posts and string with 3 strands of barbed wire. Install top rail to match existing.

**1.2.** - Stretch fabric and barb wire to meet industry tension standards.

**1.3.** - Located all fasteners on the secure side (inside). Peening or spot-welding NOT required.

**1.4.** - Galvanized 4 point barbed outrigger wire is allowed in lieu of aluminized 4 point specified in typical specifications.

**1.5. Electrical Bonding and Grounding** - See Section 16110 for requirements.

**1.6 Fence Signs** - Install 14 each government furnished metal FAA warning signs mounted at eye level every 50' around the entire fence perimeter, including on the existing AOA fence facing outward. Affix to the fence securely with minimum 11 gauge wire ties on all four corners or by other method approved by resident engineer.

## **02822 Gates**

**1. Automatic Vehicle Gate** - Provide automatic pivot gate with operator and controls. Operator motor 208 VAC. Operator controls 24 VAC. Provide 120 VAC duplex receptacle inside operator housing.

Manufacturer: Gate model HYJD 25 - Ideal Manufacturing, Billings, Montana model HYJD 25 with stanchion or approved equal. All components to be grey powder-coat finished. Include "cold weather" package (heaters on the hydraulic system components). Provide a gate and protective accessories specified.

Provide 20' wide by 8' tall pivot gate, stanchion and accessories. Provide aluminum framed gate and aluminum expanded metal screen (Amplimesh 125 pattern) or aluminum chain link fabric. Fabricate gate panel with bottom edge to match up with road cross section to provide less than 4" gap between gate bottom and pavement.

Operating audible alarm not desired.

Provide amplimesh screen to mount on operator housing to reduce fence gap.

Provide 20 amp two pole breaker in panel "ELPA" in room 104 first floor tower. Provide 4 each #10 conductors (2 hots, 1 neutral and one ground) routed in existing 2" conduit to gate operator enclosure.

Provide a 24 VAC power supply mounted inside gate operator housing and accessible from operator housing door. Power supply output sized output to power the photocells (150 mA), induction loop detector (100 mA), Linear Keypad (150 mA) and intercom (150 mA).

Provide 208/120 VAC transformer in operator housing to power one duplex 120 VAC receptacle.

**1.1 Gate photo sensor safety devices** - Provide one infrared photocell transmitter and one infrared receiver to protect obstacles in the line of the gate opening. Use separate receiver device. Reflector is not sufficient.

Mount infrared transmitter firmly on operator steel framing. Mount receiver firmly on stanchion frame. Connect gate entrapment components with the gate operator. Include weather protective hoods for photocells.

Acceptable manufacturer EMX Industries, Inc. model IRB-325. Submit catalog cut for approval.

**1.2 Gate edge safety sensors** - Provide edge sensors on the gate bottom and on the gate edge near the operator frame.

**1.3 Free Exit Loop, Ostruction Loops and Loop Detector** - Provide three preformed induction loops of #16 wire with thermoplastic elastomer insulation as shown on the drawings. Manufacturer: BD model SC52-50 or equivalent. Install in saw cut in asphalt parking lot on the secure side of vehicle gate. Use a commercial loop sealant.

Provide 24 VAC loop detector installed inside the gate operator housing. Acceptable manufacturer Dtek Industries. Submit catalog cut for approval.

**2. Pedestrian Gate** - Provide one 3'-0" wide pedestrian gate for entry with latchset for egress only using a hand knob latchset. Fabricate Best latchset and strike to accept a GFM Best lock cylinder core.

To prevent turning lockset from public side, provide and 36" diameter, round, 16 guage galvanized sheetmetal anti-tamper plate on the gate and fence. Grind or file plate edges to round sharp edges. Finish with spray grey cold galvanized finish. Install with round plate centered on the lockset. Split plate between gate panel and adjacent fence. Mount plate on public side of fabric using unistrut backing on secure side. Spot weld nuts bolts. Alternate means of attachment subject to RE approval.

Provide a gate closer similar to spring loaded "Tru-Close" round post hinges or approved equal. Submit shop drawing of latchset and vandal plate configuration for approval.

Install gate in such a mannor as to provide less than a 4" gap between gate bottom and finished grade.

## **02900 Landscape Repair**

**1.1** - Repair landscaping materials damaged during demolition and construction.

**1.2** - Where access control pedestal and foundation were removed, restore area to grade with clean crushed open graded gravel.

**1.3** - Where trenches are backfilled in the lawn area, restore grade with select excavated backfill. Place 2" topsoil on top. Position saved sod pieces to restore landscape material. Use new sod where saved sod is not viable. Provide water for replaced or planted sod as necessary for one month after repair to re-establish viability. Reasonable amounts of irrigation water on site will be provided by FAA.

END OF SECTION

## **DIVISION 3 - CONCRETE**

### **03300 Concrete**

**1. General** - The Contractor will provide and place concrete for the pivot gate operator foundation, gate stanchion, access pedestal foundation, light pole foundation, and fence posts. Where shown on the site plan, construct pivot gate foundation in accordance with manufacturer's instructions and specifications.

**2. Applicable Documents** - The following specifications and standards currently in effect form a part of this section as applicable.

#### **2.1 American Society for Testing and Materials (ASTM) Specifications**

|            |  |
|------------|--|
| ASTM C 33  | Specifications for Concrete Aggregates                       |
| ASTM C 94  | Specifications for Ready-Mixed Concrete                      |
| ASTM C 143 | Slump of Portland Cement Concrete                            |
| ASTM C 150 | Specification for Portland Cement                            |
| ASTM C 231 | Air Content of Freshly Mixed Concrete by the Pressure Method |
| ASTM C 260 | Specification for Air-Entraining Admixtures for Concrete     |
| ASTM C 494 | Specification for Chemical Admixtures for Concrete           |

#### **2.2 American Concrete Institute (ACI) Specifications**

ACI 211.1-89      Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete

ACI 308-81 Standard Practice for Curing Concrete

**3. Formwork** - Provide forms for foundations.

**3.1 Form Material** - Forms will be wood, plywood, metal or other approved material. The Contractor may use prefabricated forms. All form materials will be of the grade or type suitable to obtain the kind of finish specified.

**3.2 Form Placement** - Place forms level, with 1/4" maximum variation in 10'. Forms will result in a final structure that does not exceed +1/4" variation in 10' length from straight and flat. Form joints will be sufficiently tight to prevent leakage of mortar. Form oils will be placed on forms or form ties and will be removed from reinforcing steel or conduits if accidentally applied to such.

**4. Reinforcing Steel** - Reinforcing steel will conform to ASTM A 615, grade 60.

#### **5. Concrete Materials**

**5.1** - Cement will conform to ASTM C 150, Type III or Type IIIA.

**5.2** - Aggregate will conform to ASTM C 33. Maximum aggregate size will be 3/4-inch.

**5.3** - Water used in mixing and curing operations will be clean and free from oils, acids, organic matter and chemical suspensions that may adversely affect cure times, strength requirements or service life of the concrete.

**5.4 Admixtures** - Air entraining admixtures will conform to ASTM C 260. Admixtures used for water-reducing and retarding will conform to ASTM C 494, Type A or Type D unless otherwise specified.

## **6. Concrete Quality**

**6.1 Slump** - The concrete will have a maximum slump of 4 inches in accordance with ASTM 143 unless a plasticizing admixture has been utilized

**6.2 Strength** - Concrete, will have a 28-day compressive strength of 3,500 psi.

**6.3 Air Content** - Air entraining concrete will have an air content of 4 to 6 percent.

**7. Concrete Proportions** - Concrete materials will be proportioned in accordance with ACI 211.1 for site mixed concrete and ASTM C 94 for ready mixed concrete.

**8. Concrete Mixing and Placing** - Site mixed concrete permitted for fence posts.

**8.1 Site Preparation** - All areas to receive concrete will be inspected and approved by the Resident Engineer before concrete placement. Concrete will not be deposited on muddy or frozen material. All surfaces to be in contact with the concrete will be wetted.

**8.2 Mixing** - All mixers used for ready mix or site mix operations will be cleaned before material recharge. The area of operation of the mixers shall be such as to not endanger existing structures or excavations. Concrete will be mixed until there is a uniform distribution of materials. Concrete having attained initial set or having contained water for more than 90 minutes shall not be used.

**8.3 Conveying** - Concrete will be conveyed from the mixer to the deposit site by equipment that will prevent separation or loss of material and will ensure a nearly continuous flow of material at the deposit site.

**8.4 Depositing** - Concrete will be placed so as to prevent displacement of forms or reinforcement. Placing will be stopped if contamination due to sloughing occurs until the contaminant can be removed. If reinforcement or forms are displaced, concrete placement will be continued only if the displacement is corrected within specified tolerances. The placing of concrete will be a continuous operation at each deposit site and will be completed within 1 1/2 hours after the addition of water. Concrete will be deposited in 12- to 18-inch layers, as level as possible, before consolidation operations. Under no circumstances will fresh concrete be placed over concrete that is no longer plastic. Time between placements at each deposit site will not exceed one hour for regular mixes and two hours for retarded mixes.

**8.5 Consolidation** - Consolidation of concrete during and after placing will be performed using an internal vibrator with a vibration frequency not less than 150 Hertz. Each layer will be consolidated so that concrete is thoroughly worked around reinforcement, embedded items and forms. Vibrators will penetrate about 6 inches into underlying layers to ensure proper union of the layers. Movement of the vibrator over the layer will be such as to ensure uniform plasticity without pooling of cement.

**8.6 Finish** - After concrete placement and consolidation, the surface will be tamped with suitable tools to force coarse aggregate down from the surface, screeded with straight edges and floated and troweled to the required finish level. All concrete surfaces will have a smooth finish. All exposed edges will be rounded by bull nose finish tool approximately 3/4".

**8.7 Form Removal** - Forms will not be removed before concrete has achieved sufficient strength to preclude damage. Wood forms may be loosened within 12 to 24 hours after the placement operation if such action will not damage or deform the concrete structure. Concrete set rate depends upon temperatures, mix design and moisture provided. Gate controller foundation will be sufficiently cured before placing the pivot gate frame.

**8.8 Curing** - Concrete will be maintained above 50° F and less than 120° F and in a moist condition during the cure period. The cure period will be three days when Type III or Type IIIA Portland cement is used. Contractor will ensure the maintenance of a satisfactory moisture content and temperature so that desired properties may develop. Maintain satisfactory moisture content by covering with sheets of reinforced paper or plastic, or by the application of a membrane-forming curing compound to the freshly placed concrete. If air temperatures are expected to exceed 75° F., water curing will be continuous and forms will be loosened as soon as the concrete has set sufficiently to prevent damage. If air temperature is expected to fall below 40° F, the Contracot will provide equipment and covering to maintain a 50° concrete temperature. Salt or other chemicals to prevent freezing is not permitted.

## **9. Quality Assurance**

**9.1 Submittal** - Before placing any concrete, the Contractor will submit the supplier's concrete mix design to the Contracting Officer for approval.

**9.2 Concrete Certification** - The Contractor will provide the Resident Engineer a delivery ticket for ready mix concrete when delivered. Tickets must state the delivery date, time dispatched, project name and location, concrete supplier name, truck number, quantity, air content, admixtures and concrete design strength.

**9.3 Testing** - At the option of the RE, FAA may perform tests for concrete slump, air entrainment and compression strength. Testing costs will be paid by FAA. If such tests indicate concrete is outside of specifications, the Contractor will remedy the situation. For reday mix, concrete test sample shall be taken from the middle third of the truck batch.

**9.4 - Repair or Replacement** - The Contractor will restore concrete damaged by work under this contract to its original condition as directed by the Resident Engineer. The Resident Engineer will reject any fresh concrete not meeting slump or air entrainment requirements. Any concrete not



meeting strength requirements will be removed and replaced by the Contractor. All repair or replacement costs will be paid by the Contractor.

**9.5 - Excess Concrete Disposal** - Excess concrete will not be disposed on site or on Airport property.

END OF SECTION

## **DIVISION 13 – SPECIAL CONSTRUCTION**

### **13701 Gate Access Control**

**1. General** - Perform the following work to provide intercom system and entry control video camera. Use conduits, J-boxes and pull boxes to route conductors and wires for camera and communications systems. Electrical junction boxes should be wall mounted above the dropped ceiling grid to provide a finished appearance.

Where cable trays exist above drop panel ceilings, signal cables and 24 VAC power conductors will be run in trays without conduit. In the vertical utility chase in the tower, signal cables and 24 VAC power conductors will be run on the vertical cable ladder with Velcro ties 3 feet on centers. Provide "slack loops" to permit future relocation of components in the CAB. CAB floor is approximately 70 feet above ground.

**2. Schematic Design** – Provide a design showing the schematic wiring for the intercom system including remote releases. Provide a schematic design showing keypad cipher lock installation.

**3. Sequence of Operations for Communications Devices and Manual Gate Release from CAB –**

A. Pushing call button on the vehicle gate intercom station will activate and ring the telephone in the CAB.

B. Picking up the telephone handset in the CAB will establish the communications link between the telephone and the vehicle gate intercom station.

C. Pushing the vehicle gate release button in the CAB will activate the vehicle gate motor and open the vehicle gate to permit the visitor to pass through the gate. Gate closing is automatically controlled by safety devices including photo eye, induction loops and timer.

D. Hanging up the telephone handset deactivates communications link between the telephone in the CAB and the gate intercom station.

Note: The gate CCTV camera and monitors are in continuous operation.

The pedestal light is automatically activated at night by an approaching visitor by means of a photocell and motion detector wired in series.

**4. Automatic Vehicle Gate Access**– Install a gooseneck pedestal, keypad cipher lock and intercom station located near the vehicle gate. Components are available from:

Linear / OSCO  
19 Railroad Ave  
Casnovia, MI 49318  
800-333-1717  
FAX 616-675-5435  
[www.operatorspecialty.com](http://www.operatorspecialty.com)

Follow manufacturer's instruction to install and program devices. Provide FAA personnel on overview of operation at conclusion of contract work.

#### **4.1 Pedestal Gooseneck** - Linear model curb mount model GNC-1 or approved equal.

Locate pedestal such that the face of the intercom and keypad lock box is flush with existing traffic curb. Mount pedestal square and plumb on a concrete base. Stub up conduit for intercom and keypad 12" above foundation.

#### **4.2 Outdoor Intercom Substation Box** - Black metal lockable box with rain hood rated for outdoor use. Linear/OSCO model 2520-410 or approved equal. Mount intercom inside box, mount keypad and "push to call" button on the box.

Mount box to pedestal. Run wires inside pedestal post and terminate on the intercom and keypad lock.

#### **4.3 Key Pad** - Weather resistant, keypad programmable, 480 code capacity, 24 VAC powered with LED night light. Linear model AK-21W or approved equal.

Mount keypad on face of Substation Box.

#### **4.4 Intercom and "Push to Call" Button** - 24 VAC powered, activated by push to call button. Push to call button shall be connected to dial the phone in the tower CAB.

Mount intercom inside substation box. Mount push button on substation box face.

#### **4.5 Knox Key Switch** - Model 3502 key switch for Redmond Fire and Rescue zip code 97756. Order from website [www.knoxbox.com](http://www.knoxbox.com).

Mount keyswitch on the side of the substation box facing outward toward the public side. Verify mounting location with RE. Follow manufacturer's instructions for mounting and connecting conductors to the gate operator for emergency gate opening.

### **13702 Security Camera System**

#### **1 Pole Mounted Camera**

Install camera, enclosure and mount on pole at 7' above top of foundation. Aim to view vehicle access controls, entrance gate and pedestrian gate. Adjust camera lens focus to provide a view of the vehicle and the gate vicinity. Set camera lens focal length for appropriate field of vision and back focus for sharp definition. Check focus at night for performance in LED light conditions.

Route video cable from camera to control enclosure near gate operator and then via existing buried 2" PVC conduit into the Cab. Terminate video output to existing CCTV monitor in CAB (existing monitor has dual video input and switching capability). Run continuous, splicing not permitted

#### **1.1 Camera** - Color rated, fixed focus, 24 VAC, 3.3 watts, low-light model. Pelco CC3751H-2 or approved equal.

**1.2 Lens** - 1/3" format, fixed iris, manually variable focal length, indoor rated. Pelco Varifocal lens 13VA series.

**1.3 Enclosure** - Outdoor-rated, grey-finished aluminum housing, lexan window, with 24 VAC camera power supply kit, 120 VAC heater blower kit and sun shroud. Maximum power consumption 25W at 24 VAC. Pelco enclosure EH1512-1LMTS.

**1.4 Mount** - Outdoor-rated, grey-finished aluminum with wiring concealed inside mount. Suitable for mounting on square pole face. Pelco mount EM1512. Drill and tap pole as necessary to install camera mount and run conductors to camera.

**1.5 Camera Power Supply** - 24 VAC, interior rated, plug-in type, interior-rated, rated for 20 VA. Mount power supply inside new 8" deep electrical NEMA 4 box near vehicle gate operator enclosure. Plug power supply into receptacle. Run 16 AWG wire continuous in conduit from power supply to camera on pole. Conduit shall terminate at pole handhole. Conductors shall terminate on the camera.

END OF SECTION

## **DIVISION 16 ELECTRICAL**

All electrical, grounding and bonding will conform to the following FAA and industry standards: FAA-C-1217F, FAA-STD-019E, FAA-STD-020B, FAA-C-1391B, NEC, NFPA 70 and NFPA 780.

### **16060 Gate Vicinity Bonding and Grounding**

Provide conductive bonding and grounding for gate and nearby components as shown on the drawing.

1. Drive 3/4" x 10' copper or copper clad ground rods located as shown. Rod tops to at least 12" minimum below grade.
2. Provide bare copper 4/0 conductors from grounded components to the tops of ground rods. Bond conductors to above grade components with suitably sized UL rated lug connectors or exothermic welding. Bond conductors to rod tops by exothermic welding. For all buried connections, conductors must be bonded ground rods by exothermic welds only.
3. Dig a minimum 18" deep trench between those rods to be interconnected at gate openings. Install a bare copper 4/0 conductor to connect all ground rods. Exothermically weld 4/0 conductor to each ground rod. Bury conductors minimum 18" below grade. Splices in this conductor will be exothermic weld only. Backfill trench with excavated material. Compact in 12" lifts with hand tamper to stabilize fence post foundations.
4. At 6' above grade, interweave a bare, stranded, #6 copper wire through the chain link fence fabric. At the post locations near ground rods, bond the wire to the fence posts with a UL rated lug connector clamp sized for the post and the #6 wire. Splice #6 wire with electrical rated connectors.
5. Bond gate leaves by braided copper straps affixed to adjacent fence posts with electrically rated clamps with lugs or other comparable method approved by RE.
6. Advise resident engineer of any buried ground rods or copper wire encountered in fencing.

### **16100 Wiring Methods**

#### **1. General**

**1.2** - Bury conduits a minimum of 24" below grade.

**1.3** - Utilize locate service, site plans and local FAA technician to locate existing utilities. Hand dig 3 feet either side of existing utilities.

**1.4** - Select conduit routes to minimize disturbance to site improvements and existing utilities. Provide wire insulation on power and control conductors appropriate for wet locations.

**1.5** - Route 120 VAC power conductors and communication wires/control cables in separate conduits.

**2. Gate Operator** - Provide a 208 V circuit for the gate operator, exterior luminaire and camera circuits. Gate operator will be have integral 208/120 V transformer inside housing for camera, light, and photo eye circuits. Install circuit breakers in Square D distribution panel "ELPA" located in tower building room 104. FAA RE will update the panel directory and record circuits used on the record drawings.

Conform to provisions of NEC and FAA Order 1217f. Use conduit compression couplings, indent fittings not permitted.

Comply with NEC and provision of 1217f (see appendix B). Buried conduit shall be tape wrapped or PVC-coated RSG conduit

### **3. Electrical Circuit and Conductor Routes**

#### **3.1 - 208 VAC 2-Pole - Tower to Gate Operator**

Provide one 1-1/2" EMT conduit from Panel "ELPA" in room 104 to existing 2" PVC conduit stubbed into existing box mounted on wall.

Using this conduit, route 4 - #10 conductors (2 hot, 1 neutral, 1 ground) from spare 20 amp 208 VAC two pole breaker to gate operator housing. Connect conductors to gate control panel per manufacturer's instructions.

#### **3.2 - 120 VAC single phase - Tower to Light Pole for Camera and L.E.D. Light**

Also using this same 1-1/2" conduit, route 3 - #10 conductors from spare 20 amp 120 VAC single pole breaker to new hand hole near entrance sign. From there, run continuous via new 3/4" buried PVC conduit to motion detector on new light pole.

#### **3.3 - 24 VAC Gate Operator to Gate Pedestal**

In new 3/4" buried PVC conduit, route 4 - #18 conductors to keypad and intercom.

#### **3.4 - 24 VAC Gate Operator to Protective Photo Eye**

In new 3/4" buried RGS conduit, route 2 - #18 conductors to photo eye near gate stanchion.

#### **3.5 - 24 VAC Internal to Gate Operator.**

Inside the gate operator housing, gate fabricator will provide 208/120 V step down transformer, 120V 15 amp duplex receptacle.

### **4. Communications and Camera Wires**

**4.1** - In new 3/4" buried PVC conduit, route 4- #16 conductors from intercom master station to gate operator housing.

**4.2** - In new 3/4" buried PVC conduit to gate operator, route 1 - RG6 from camera to existing monitor in Tower Cab via new and existing conduits.

### **5. Interior Grounding Plate Relocation**

**5.1** - In tower electrical room #104 relocate the ground plate and conductors as follows.

**5.2** - Disconnect 3 each #4/0 conductors terminated to top of plate. Cut off crimped terminal connectors. Cut conductors shorter as appropriate to terminate conductors on relocated ground plate. Use high pressure hydraulic crimp on new terminal connectors.

**5.3** - Disconnect 1 each #4/0 conductors 1 each 500 KCM conductor terminated to bottom of plate. Cut off crimped terminal connectors from conductors. Extend 4/0 and 500 KCM conductors by exothermic weld splice as appropriate to terminate conductors on relocated ground plate. Splices shall be welded during night time operating hours when tower is not staffed. Use high pressure hydraulic crimp new terminal connectors.

**5.4** - Remove wall mounted copper ground plate assembly and unistrut above the ground plate.

**5.5** - Cut 3 each 1" PVC conduits at 8' above finished floor.

**5.6** - Remount the ground plate assembly and conduit clamps at 8' above finished floor.

**5.7** - Remount ground plate assembly at 7' above finished floor.

**5.8** - Reterminate 5 conductors to ground plate assembly. Mark conductors with orange and yellow tape bands to replicate original installation.

### **16520 Exterior Pole, Camera, and Luminaire**

**1.** Provide concrete foundation. Install mounting bolts per pole base template. Stub up 2 schedule 40 PVC conduits from foundation. Conduits are for light, camera power, and video feed. Predrill pole for luminaire, camera housing and motion detector

**2.** Provide 4" x 4" x 10' square steel pole on concrete foundation. Pole to be 11 gauge with 3" x 5" hand hole 18" above base. Bronze finish to match existing light poles on site. Provide four galvanized 3/4" x 17" anchor bolts, nuts and washers. Install bolts to align pole toward access control pedestal at gate. Shim and grout base plate as necessary to plumb pole. Manufacturer: RAB Lighting Inc, model PS4-11-10D2 or approved equal.

Drill or penetrate pole as appropriate to mount camera, motion sensor, and LED luminaire.

Install in accordance with manufacturer's instructions.

**3.** Provide LED luminaire, 120 VAC, 10 watt LED lamp and prefitted with 120 VAC photocontrol. (Light output will be similar to 50 w metal halide lamp). Include lamp with fixture. Manufacturer: RAD Lighting Inc model ALED10/PC or approved equal.

Use pole as raceway for conductors. Install luminaire in accordance with manufacturer's instructions.

**4.** Provide motion detector to activate LED light. Motion detector will be 120 VAC, 1 watt, integral photo eye, 110 degree view. Time adjustment from 10 seconds up to 5 minutes. Color black, switching capacity 500 watts incandescent. Sensor RAB Lighting model GT500 or approved equal.

Install in accordance with manufacturer's instructions.

### **16700 Communication System**

**1. Intercom System and Cab Remote Gate Opener** – Provide audio intercom on gate pedestal. Intercom door station compatible with existing Meridian analog telephone system and programmable to dial the 4 digit Cab extension. Provide push button located in Cab on console to manually remotely open vehicle gate. Install in accordance with manufacturer's instructions. Run all communications and low voltage wires in raceways, except when in cable trays or tower ladder. Provide a schematic layout showing terminations and connections on all units, including remote door releases.

END OF SECTION

## **ATTACHMENT A**

### **FAA STANDARD SPECIFICATIONS**

Section 02831 Chain Link Fence and Gates – Standard FAA Specification

Technical Specifications for Pivot Gate and Operator – Ideal Manufacturing

Fence grounding information (excerpt section 3.7.11 from FAA Std 19d)